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(54) Improvements relating to reflective sheets

(57) A backing sheet 1 suitably of a plastics material is coated with layers 2, 3 of an ink which is then allowed to dry, and glass microspheres 4 are then partially embedded in, and adhered to, the ink layer 3 as it dries, to create a retroreflective layer. Finally a cover sheet 5 of a clear polyvinylchloride material is welded around the uncoated edges 6 of the backing sheet 1. The cover sheet 5 is pre-printed, in this case, with words or symbols in a blue pastel shade in a regular repetitive array. This reflective sheet presents a generally evenly distributed retroreflective effect whilst the words or symbols provide enhanced luminance in the final product when viewed from afar, but will stand out when viewed from nearby. In an alternative arrangement, the words or symbols may be printed on the backing sheet in areas where the retroreflective layer is omitted.

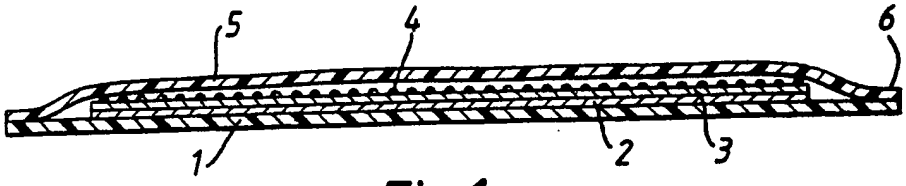

Fig.1.

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1990.

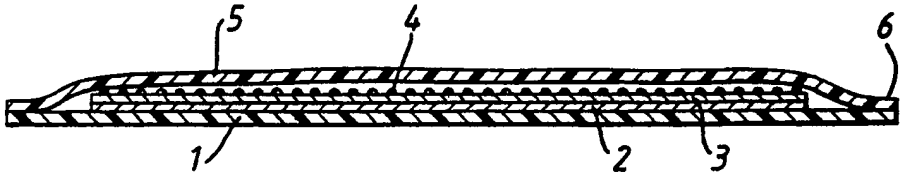

Fig.1.

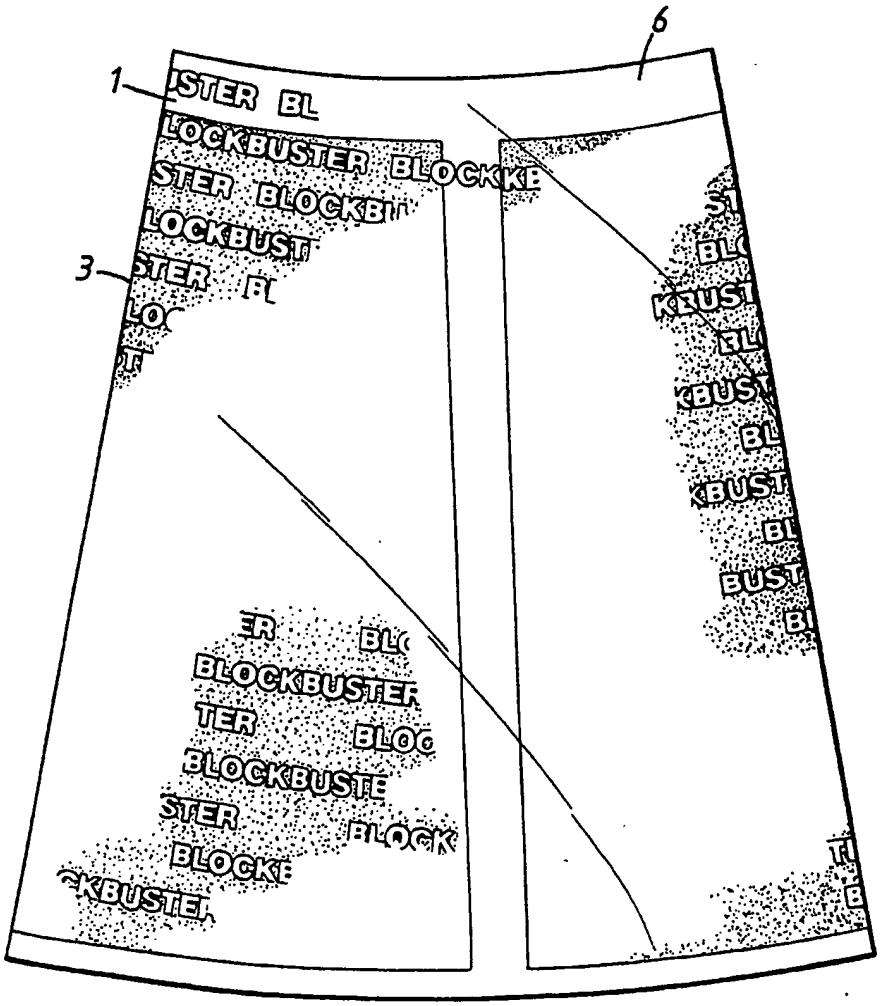

Fig.2.

"Improvements relating to Reflective Sheets"

This invention is concerned with reflective sheets which need to have good reflective properties when a light, such as a car headlamp, is shone on the sheet in darkness. It is also desirable that the sheet should be clearly visible in ordinary daylight. Whilst such sheets might be used as blinds or signs of a rigid or flexible nature, a particular use is as sleeves on road cones and as such they have to meet particular standards both for reflectivity and luminance. A particular type of construction for such reflective sheets results in the creation of a retro-reflective layer which gives good reflective characteristics but which tends to have poor luminance characteristics in daylight.

It is an object of this invention to create a reflective sheet which provides adequate luminance without substantially reducing the reflective properties of the sheet.

Accordingly this invention provides a reflective sheet comprising a backing sheet coated with a reflective material, spheres of glass or a comparable material provided on the outer surface of the reflective material to create a retroreflective effect, and a cover-sheet of a clear or translucent material over the retroreflective layer, with non-retroreflective display areas of the reflective sheet presenting a pastel shade colour in the form of symbols, lettering or words.

It has been found that the areas coloured with a pastel shade provide good luminance properties. It is particularly preferred that the display areas should be provided in a generally regular repetitive array so that the retro-reflective portions of the sheet are also evenly spread over the area of the sheet. The display areas can, with advantage, comprise slogans or trade marks repeated in a regular fashion over the sheet.

It is preferred that the display areas should be applied as a coating to the cover sheet or directly onto the exposed surface of the retroreflective layer. It would however, be possible for the display areas to be applied to the backing sheet in areas where the retroreflective area is omitted.

It will be appreciated that the term "pastel shade" refers to a colour of a light hue which will therefore present a significant level of luminance whilst still projecting a particular colour effect. Possible pastel shades are those of blue, yellow, green or pink.

The invention may be performed in various ways and one preferred embodiment will now be described with reference to the accompanying drawings in which:

Figure 1 is a cross-section through a reflective sheet constructed in accordance with the invention; and

Figure 2 is a view of a road cone sleeve formed from the reflective sheet illustrated in Figure 1.

The basic sheet from which the sleeve illustrated in the accompanying drawings is constructed is built up upon a

backing sheet 1 of a white flexible polyvinylchloride material (or other suitable material). This is coated, by screen printing, with a layer 2 of a silver-coloured aluminium ink (or other suitable colouring material) which is then allowed to dry. A second coat 3 of ink is applied by the same method and glass microspheres 4 are then applied to the ink coat 3 before it has dried so that the spheres 4 will become partially embedded in, and adhered to, the ink layer 3 as it dries. This creates a retroreflective layer. Finally a cover sheet 5 of a clear polyvinylchloride material (or other suitable material) is welded around the uncoated edges 6 of the backing sheet 1. The cover sheet 5 is pre-printed, in this case, with the words BLOCKBUSTER in a blue pastel shade. The words BLOCKBUSTER are set out in a regular repetitive array as can been seen clearly from Figure 2.

It will be appreciated that the construction illustrated in Figure 1 can be applied to any desired reflective sheet, thus including both flexible and rigid signs, by utilising suitable materials for the backing sheet 1 in particular. Any form of repetitive array of symbols, letters or words to present a decorative or informative appearance may be utilised instead of the words BLOCKBUSTER. This array could, if desired, be an evenly distributed set of instructions or information. The effect of such constructions is to produce a reflective sheet which presents a generally evenly distributed retroreflective effect whilst the words or symbols provide enhanced luminance in the final

product. Also information can be displayed on the sheet in a readily readable form as pastel shade words will stand out when viewed from nearby.

A similar effect to that illustrated can be achieved by selectively coating the backing sheet 1 with the retroreflective layer (comprising the ink layers 2 and 3 and the glass spheres 4) so as to leave exposed areas of the backing sheet which will be coloured with the blue pastel shade in the desired array. For this purpose, the backing sheet 1 could be coated as a first step with the pastel colour or the backing sheet itself could be formed from a material which is of the pastel colour. Naturally pastel shades other than blue, such as yellow, green or pink, could be used, but blue has been found to be particularly effective.

CLAIMS

1. A reflective sheet comprising a backing sheet coated with a reflective material, spheres of glass or a comparable material provided on the outer surface of the reflective material to create a retroreflective effect, and a cover-sheet of a clear or translucent material over the retroreflective layer, with non-retroreflective display areas of the reflective sheet presenting a pastel shade colour in the form of symbols, lettering or words.

2. A sheet according to Claim 1, wherein the display areas are provided in a generally regular repetitive array so that the retro-reflective portions of the sheet are also evenly spread over the area of the sheet.

3. A sheet according to Claim 1 or Claim 2, wherein the display areas comprise slogans or trade marks repeated in a regular fashion over the sheet.

4. A sheet according to any one of Claims 1 to 3, wherein the display areas are applied as a coating to the cover sheet or directly onto the exposed surface of the retroreflective layer.

5. A sheet according to any one of Claims 1 to 3, wherein the display areas are applied to the backing sheet in areas where the retroreflective area is omitted.

6. A sheet according to any one of Claims 1 to 5, wherein the pastel shades employed are those of blue, yellow, green or pink.

7. A reflective sheet substantially as herein described with reference to the accompanying drawings.

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